

WHAT IS CLAIMED IS:

1. A system for dynamically modifying functionality in a configurable communications protocol stack, comprising:

5 a system controller operable to communicate new protocol stack software to an interface device for purposes of modifying existing protocol stack software operating on the interface device; and

the interface device, coupled to a plurality of telephony resources and operable to:

10 operate a protocol stack comprising the existing protocol stack software, the example protocol stack software operable to process events associated with connections initiated subsequent to the existing protocol stack software being activated for new connections;

15 receive the new protocol stack software from the system controller, the new protocol stack software operable to process events associated with connections initiated subsequent to the new protocol stack software being activated for new connections;

20 activate the new protocol stack software for new connections, the existing protocol stack software continuing to process all events associated with connections initiated before the new protocol stack software was activated, the new protocol stack software processing all events associated with connections initiated after the new protocol stack software was activated; and

25 remove the existing protocol stack software upon completion of all connections initiated before the new protocol stack software was activated, services provided to the telephony resources being substantially uninterrupted by the modification.

30 2. The system of Claim 1, wherein the interface device comprises a stack management process and each portion of the protocol stack that may be dynamically modified is associated with a unique functionality identification key, the stack management process operable to:

 compare a functionality identification key of the new protocol stack software

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with a functionality identification key of the existing protocol stack software;

if the functionality identification key of the new protocol stack software is not already active, activate the new protocol stack software for all future connections, the new protocol stack software being entirely new to the system;

5 if the functionality identification key of the new protocol stack software is already active, activate the new protocol stack software and deactivate the existing protocol stack software, the new protocol stack software being an upgrade, replacement, or other modification of the existing protocol stack software.

10 3. The system of Claim 1, wherein modifying protocol stack functionality in a configurable communications protocol stack comprises at least one of:

upgrading the existing protocol stack software with the new protocol stack software, the new protocol stack software being a different version of the same protocol variation as the existing protocol stack software; and

15 replacing the existing protocol stack software with the new protocol stack software, the new protocol stack software being a different protocol variation than the existing protocol stack software.

20 4. The system of Claim 1, wherein the new protocol stack software comprises an entire protocol stack.

25 5. The system of Claim 1, wherein the protocol stack is an integrated services digital network (ISDN) protocol stack and the interface device is an ISDN interface device.

6. The system of Claim 1, wherein:

the protocol stack comprises a local data link layer interface portion associated with a local call agent and a network layer interface portion associated with a remote call agent; and

30 functionality associated with the local data link layer interface and network layer interface portions may be independently modified.

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7. The system of Claim 6, wherein a first stack management process manages modifications to the local data link layer interface portion and a second stack management process manages modifications to the network layer interface portion.

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8. A method for dynamically modifying functionality in a configurable communications protocol stack, comprising:

at an interface device, operating a protocol stack comprising existing protocol stack software operable to process events associated with connections initiated subsequent to the existing protocol stack software being activated for new connections;

communicating new protocol stack software from a system controller to the interface device for purposes of modifying the existing protocol stack software operating on the interface device coupled to a plurality of telephony resources;

10 at the interface device, receiving the new protocol stack software from the system controller, the new protocol stack software operable to process events associated with connections initiated subsequent to the new protocol stack software being activated for new connections;

15 activating the new protocol stack software for new connections, the existing protocol stack software continuing to process all events associated with connections initiated before the new protocol stack software was activated, the new protocol stack software processing all events associated with connections initiated after the new protocol stack software was activated; and

20 removing the existing protocol stack software upon completion of all connections initiated before the new protocol stack software was activated, services provided to the telephony resources being substantially uninterrupted by the modification.

25 9. The method of Claim 8, wherein the interface device comprises a stack management process and each portion of the protocol stack that may be dynamically modified is associated with a functionality identification key, the stack management process comprising:

30 comparing a functionality identification key of the new protocol stack software with a unique functionality identification key of the existing protocol stack software;

if the functionality identification key of the new protocol stack software is not

already active, activating the new protocol stack software for all future connections, the new protocol stack software being entirely new to the system;

if the functionality identification key of the new protocol stack software is already active, activating the new protocol stack software and deactivating the existing protocol stack software, the new protocol stack software being an upgrade, replacement, or other modification of the existing protocol stack software.

10. The method of Claim 8, wherein modifying protocol stack functionality in a configurable communications protocol stack comprises at least one of:

upgrading the existing protocol stack software with the new protocol stack software, the new protocol stack software being a different version of the same protocol variation as the existing protocol stack software; and

15 replacing the existing protocol stack software with the new protocol stack software, the new protocol stack software being a different protocol variation than the existing protocol stack software.

20. The method of Claim 8, wherein the new protocol stack software comprises an entire protocol stack.

25. The method of Claim 8, wherein the protocol stack is an integrated services digital network (ISDN) protocol stack and the interface device is an ISDN interface device.

30. The method of Claim 8, wherein:
the protocol stack comprises a local data link layer interface portion associated with a local call agent and a network layer interface portion associated with a remote call agent; and

functionality associated with the local data link layer interface and network link interface portions may be independently modified

14. The method of Claim 13, further comprising managing modifications to the local data link layer interface portion using a first stack management process and managing modifications to the network layer interface portion using a second stack management process.

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15. Logic encoded in media for dynamically modifying functionality in a configurable communications protocol stack, the logic when executed operable to:

5 at an interface device, operate a protocol stack comprising existing protocol stack software operable to process events associated with connections initiated subsequent to the existing protocol stack software being activated for new connections;

10 communicate new protocol stack software from a system controller to the interface device for purposes of modifying the existing protocol stack software operating on the interface device coupled to a plurality of telephony resources;

15 at the interface device, receive the new protocol stack software from the system controller, the new protocol stack software operable to process events associated with connections initiated subsequent to the new protocol stack software being activated for new connections;

20 activate the new protocol stack software for new connections, the existing protocol stack software continuing to process all events associated with connections initiated before the new protocol stack software was activated, the new protocol stack software processing all events associated with connections initiated after the new protocol stack software was activated; and

25 remove the existing protocol stack software upon completion of all connections initiated before the new protocol stack software was activated, services provided to the telephony resources being substantially uninterrupted by the modification.

16. The logic of Claim 15, wherein the interface device comprises a stack management process and each portion of the protocol stack that may be dynamically modified is associated with a functionality identification key, the stack management process operable to:

30 compare a functionality identification key of the new protocol stack software with a unique functionality identification key of the existing protocol stack software;

if the functionality identification key of the new protocol stack software is not already active, activate the new protocol stack software for all future connections, the

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new protocol stack software being entirely new to the system;

if the functionality identification key of the new protocol stack software is already active, activate the new protocol stack software and deactivate the existing protocol stack software, the new protocol stack software being an upgrade, replacement, or other modification of the existing protocol stack software.

17. The logic system of Claim 15, wherein modifying protocol stack functionality in a configurable communications protocol stack comprises at least one of:

10 upgrading the existing protocol stack software with the new protocol stack software, the new protocol stack software being a different version of the same protocol variation as the existing protocol stack software; and

15 replacing the existing protocol stack software with the new protocol stack software, the new protocol stack software being a different protocol variation than the existing protocol stack software.

18. The logic of Claim 15, wherein the new protocol stack software comprises an entire protocol stack.

20 19. The logic of Claim 15, wherein the protocol stack is an integrated services digital network (ISDN) protocol stack and the interface device is an ISDN interface device.

25 20. The logic of Claim 15, wherein:

the protocol stack comprises a local data link layer interface portion associated with a local call agent and a network layer interface portion associated with a remote call agent; and

functionality associated with the local data link layer interface and network layer interface portions may be independently modified.

30 21. The logic of Claim 20, further comprising managing modifications to

the local data link layer interface portion using a first stack management process and managing modifications to the network layer interface portion using a second stack management process.

22. A system for dynamically modifying functionality in a configurable communications protocol stack, comprising:

means for, at an interface device, operating a protocol stack comprising existing protocol stack software and operable to process events associated with connections initiated subsequent to the existing protocol stack software being activated for new connections;

means for communicating new protocol stack software from a system controller to the interface device for purposes of modifying the existing protocol stack software operating on the interface device coupled to a plurality of telephony resources;

means for, at the interface device, receiving the new protocol stack software from the system controller, the new protocol stack software operable to process events associated with connections initiated subsequent to the new protocol stack software being activated for new connections;

means for activating the new protocol stack software for new connections, the existing protocol stack software continuing to process all events associated with connections initiated before the new protocol stack software was activated, the new protocol stack software processing all events associated with connections initiated after the new protocol stack software was activated; and

means for removing the existing protocol stack software upon completion of all connections initiated before the new protocol stack software was activated, services provided to the telephony resources being substantially uninterrupted by the modification.

23. A system for dynamically upgrading or replacing functionality in a configurable communications protocol stack, comprising:

5 a system controller operable to communicate new integrated services digital network (ISDN) protocol stack software to an ISDN interface device for purposes of modifying existing ISDN protocol stack software operating on the ISDN interface device; and

the ISDN interface device, coupled to a plurality of telephony resources, comprising a stack management process, and operable to:

10 operate an ISDN protocol stack comprising the existing ISDN protocol stack software, the existing protocol stack software operable to process ISDN signaling events associated with ISDN connections initiated subsequent to the existing ISDN protocol stack software being activated for new ISDN connections, each portion of the ISDN protocol stack that may be dynamically modified being associated with a unique functionality identification key; and

15 receive the new ISDN protocol stack software from the system controller, the new ISDN protocol stack software operable to process ISDN signaling events associated with ISDN connections initiated subsequent to the new ISDN protocol stack software being activated for new ISDN connections, the stack management process operable to compare a functionality identification key of the new ISDN protocol stack software with a functionality identification key of the existing ISDN protocol stack software and:

20 25 if the functionality identification key of the new ISDN protocol stack software is not already active, activate the new ISDN protocol stack software for all future ISDN connections, the new ISDN protocol stack software being entirely new to the system and operable to process all ISDN signaling events associated with ISDN connections initiated after the new ISDN protocol stack software was activated; and

30 if the functionality identification key of the new ISDN protocol stack software is already active, activate the new ISDN protocol stack software and deactivate the existing ISDN protocol stack software, the new ISDN protocol stack software being an upgrade or replacement of the existing ISDN protocol stack

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software, the existing ISDN protocol stack software continuing to process all ISDN signaling events associated with ISDN connections initiated before the new ISDN protocol stack software was activated, the new ISDN protocol stack software processing all ISDN signaling events associated with ISDN connections initiated after the new ISDN protocol stack software was activated; and

remove the existing protocol stack software upon completion of all connections initiated because the new protocol stack software was activated, services provided to the telephony resources being substantially uninterrupted by the modification.